

## ABSTRACT OF THE DISCLOSURE

A deterioration detection apparatus for an oxygen sensor is able to detect an abnormality of the oxygen sensor constantly with high precision, without being  
5 affected by the temperature characteristic of the element impedance. The apparatus applies a voltage  $V$  to the oxygen sensor, and calculates an element impedance real value  $R_{sr}=V/I$  of a sensor element based on the applied voltage and the current  $I$  caused to flow by the voltage. The apparatus calculates an element temperature  
10 estimated value  $T_{ex}$  of the oxygen sensor from a factor that affects the temperature of the oxygen sensor. The apparatus determines whether the oxygen sensor has an abnormality on the basis of whether the relationship between the element impedance real value  $R_{sr}$  and the element temperature estimated value  $T_{ex}$  can be regarded as a relationship that agrees with a normal temperature characteristic.